CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

Vol. XII NOVEMBER, 1940 No. 11

Carlos Faust, founder of the Mar y Murtra Gardens in Spain.

CACTUS AND SUCCULENT JOURNAL

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PRESIDENT'S MESSAGE

With particular pleasure we welcome to affiliation this month the Cactus and Succulent Society of New Jersey with headquarters in Plainfield. From a start of six members two months ago this group has now 18 members and prospects of many more. The initial meeting was held at the glasshouse of our good friend H. O. Bullard at Hackensack and incidentally H. O. tells us that the Lehigh Valley group were his most recent guests.

The second new affiliate is the Cactus Club of Freeport, Illinois, and members in that vicinity are requested to communicate with them.

Plans are now well under way for the first convention of the Society which will be held in July at the Missouri Botanical Gardens at St. Louis, Mo. In addition to the central location, St. Louis is the ideal spot for our first general meeting because of the associations centering in the Missouri Botanical Gardens. There Dr. Engelmann became the first great American cactologist and Dr. Trelease wrote on the Agaves and Yuccas. There also will be found Dr. Engelmann's herbarium, one of the finest botanical libraries in the country, and two houses of desert plants comprising most of the material on which "The Cactaceae" was based.

The exact week in July will be announced as soon as our affiliates vote on the week which is most acceptable to them. This matter should be discussed at the earliest meeting of each affiliate along with the other subjects we shall mention; a reply should be sent to me at once.

To facilitate the work of planning the convention, a committee will be appointed and to this committee one member from each affiliated group will be assigned. You are requested to send your nomination for the committeeman from your group at once.

Delegates to the general meeting will be appointed by each group who will be accredited to the convention, but as many members as possible from each affiliate are invited to attend. A proposed program will soon be announced, but affiliates should appoint their delegates at the earliest possible moment and be sure that the delegates and their alternates can attend the meeting.

A commercial show will be held in a large house at the Botanical Gardens in which reputable dealers may buy space for the display of cacti and other succulents and the proceeds will be used to defray some necessary expenses.

Secretaries of affiliated groups are requested to read this message to their groups at the next meeting.

At the same time, I request that a committee be appointed to solicit Commercial Memberships from reputable dealers in your vicinity. Such members are elected on nomination of local groups and for a fee of $3.00 per year, in addition to membership, are entitled to listing in the preferred dealers list in the JOURNAL each month.

Your group should also at this time send in your nominations for Fellowships in the Society—an honor to which any member can be elected if his group recommends him for outstanding work in research, writing, field work or promotion work in the interest of xerophytic plants. This Fellowship costs an additional $3.00 per year and groups wishing to do honor to outstanding members could do so by nominating them for fellowship and paying the additional $3.00 per annum from the group's treasury.

For particularly fine promotional work, the following persons among many others should be nominated for Fellowships: Chas. R. Cole, Cincinnati; Pat White of Milwaukee; Mrs. Harry Lewis of Seattle; Wm. A. Pluemer of Plainfield; Mrs. Glen Wickliff, Des Moines; Mrs. Gertrude Webster, Phoenix; W. C. Andrews, Oakland; and a host of others known to you. For valuable JOURNAL articles and other writings, Fellowship nominations should be made for the following: Edgar Baxter, J. R. Brown, H. E. Gates, Dr. R. W. Poindexter and Scott Haselton all of California; A. S. Harmer, Dieringer, Wash.; Prof. A. Blocher, Amboy, Ill.; O. P. Young, Maine; Jessie L. Seele, Oklahoma; Marjorie Lee, Oklahoma; R. H. Peebles, Ariz.; and many others who have afforded you pleasure and information in the pages of our JOURNAL.

In this JOURNAL you will find a ballot for officers for the coming year. Please vote.

W. TAYLOR MARSHALL.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912. Of Cactus and Succulent Journal, published monthly at Pasadena, for November, 1939, State of California, County of Los Angeles.

Before me, a notary in and for the State and County aforesaid, personally appeared Scott E. Haselton, who, having been duly sworn according to law, deposes and says that he is the Editor-Publisher of the CACTUS AND SUCCULENT JOURNAL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Scott E. Haselton, Box 101, Pasadena.

2. That the owner is: CACTUS AND SUCCULENT SOCIETY OF AMERICA, INC., and leased to SCOTT E. HASELTON, who created and published said magazine to date.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None. Cactus and Succulent Society is a non-profit organization and issues no stock.

SCOTT E. HASELTON.

A Garden Which Has Survived the Spanish War

By ALAIN WHITE AND BOYD L. SLOANE

Few plants are more intimately associated with the Mediterranean Sea than the common myrtle of southern Europe, *Myrtus communis*. It is a bushy shrub, with evergreen leaves, fragrant white or rosy flowers, and pulpy black berries. The myrtle has come down through the centuries, first introduced from Asia, a shrub dedicated to the goddess Venus, its leaves worn alike by the stern lawmakers and the young athletes of ancient Greece and Rome, the fragrance of its flowers ever alluring the poet, so that when one speaks of the Sea and the Myrtle, one can be thinking only of the shores of the blue Mediterranean, a favored shore in beauty and climate.

About a dozen years ago, Carlos Faust conceived the plan of founding a garden which should gather into itself the essence of the Mediterranean and he called it, quite spontaneously, Mar y Murtra, Sea and Myrtle.

This garden should be located near the fishing village of Blanes in the province of Gerona, about fifty miles northeast of Barcelona on the Costa Brava, where the Catalonian climate is well-nigh perfect. Here should be preserved in its natural state a large tract of the typical Mediterranean forest, pines and oaks and all the lesser growth that accompanies the greater trees; here in a smaller made garden should come as guests the subtropical vegetation of many lands, Silvertrees from the Cape, Grevilleas and other *Proteaceae* from Australia, cypresses and acacias, the stately Eucalyptus and a wide variety of palms; and here too the succulents should be welcomed and allowed to thrive, cacti and euphorbias and mesembs. and all the rest. Here botany should provide a nucleus around which all the biology of the Mediterranean might center, including marine life down to the humblest protozoa. Here the scientists of the great European centers might come in three or four hours by plane, from Zurich or Vienna, Berlin or Amsterdam, and they would find growing here in the open all the

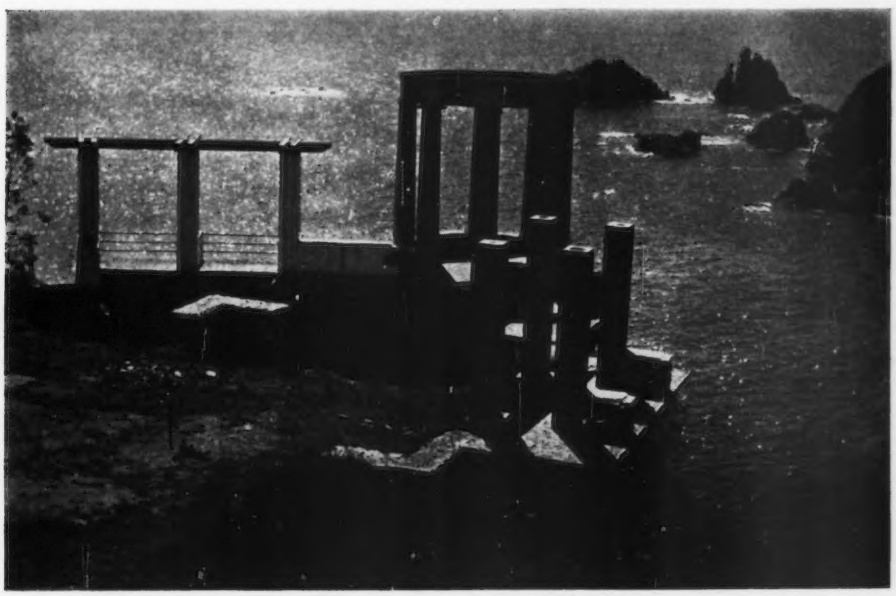


FIG. 1. The Pergola of Linnaeus, under construction.

FIG. 2. The Ruiz y Pavon walk.

FIG. 3. View of Costa Brava from the garden.

treasures which in their own less favored regions were restricted to the artificial environment of the green-houses. There should be a library to assist the student, and the most charming architecture and landscaping to delight the artist. There should also be spots dedicated to the great botanists of the past to keep their memories awake in the minds of all visitors, a belvedere in memory of de Candolle, a pergola consecrated to Linnaeus, a walk named for Ruiz y Pavon, and many more.

Carlos Faust has always been a man of vision. His dreams were built around the growth of his garden, botany, biology, science, art, architecture, the wind blowing down the Costa Brava through the branches of the pines, myrtles in flower and the Sea. And this dream began soon to take shape under the generous guidance of the founder. A corporation was established to hold the land, the Blanes International Station for Mediterranean Biology. This foundation operates under the guidance of an international council composed of a number of learned societies, including at the present time the Swiss Society of Natural Science, the Swiss Botanical Society, the Kaiser Wilhelm Society of Berlin, the Netherlands Botanical Association of Amsterdam and the Swedish Botanical Association of Stockholm. Two Spanish societies will probably be added to the council shortly, the Spanish Natural History Society of Madrid, and the Botanical Institute of Barcelona. Mr. Faust is himself the director of the garden.

When his dream seemed most full of promise the Spanish Civil War began, and for the intervening years everything has been uncertainty and confusion. Mr. Faust's apartment in Barcelona was ransacked and his valuable collection of photographs largely destroyed; the pines and oaks of Mar y Murtra were all cut down by the combatants; but through all the chaos no damage was done to the plants by man. It remained for the elements, in the form of the record cold spell of February, 1940, to come down upon the garden and bring havoc to the more tender succulents and palms. The euphorbias suffered most; the cacti proved relatively hardy.

After such a double calamity it would have seemed to most persons as if everything must be given up. But Carlos Faust is not easily discouraged. It is true that the available income to continue the garden is now much reduced; it is

FIG. 4. The Villa and Library.

true that the outlook is still dark; but the dream still holds. The pergola of Linnaeus (Fig. 1) is still uncompleted, but it has stood through the entire Civil War and it still looks out over the rocks of the Costa Brava, a thing of beauty. The *Agave americana's* have grown year by year and stand guard over the blue waters below (Fig. 3). The Library and Villa are unscathed (Fig. 4). On the Ruiz y Pavon walk (Fig. 2) the Mexican Opuntias and other plants have been unmolested. In the California garden the Chollas stand in prickly well being, and in the South African corner *Kleinia tomentosa* still feels the satisfying warmth of the rocks. Already the forest is beginning slowly to spring up once more, bereft only of its pines.

The whole of Mar y Murtra takes its cue from Carlos Faust and looks to the future, and the spirit is one of promise again. There is still so much of beauty here, and the world prays for more kindly years ahead, in which the humblest garden may find protection and such a generous dream as Mar y Murtra may come to its fullest realization.

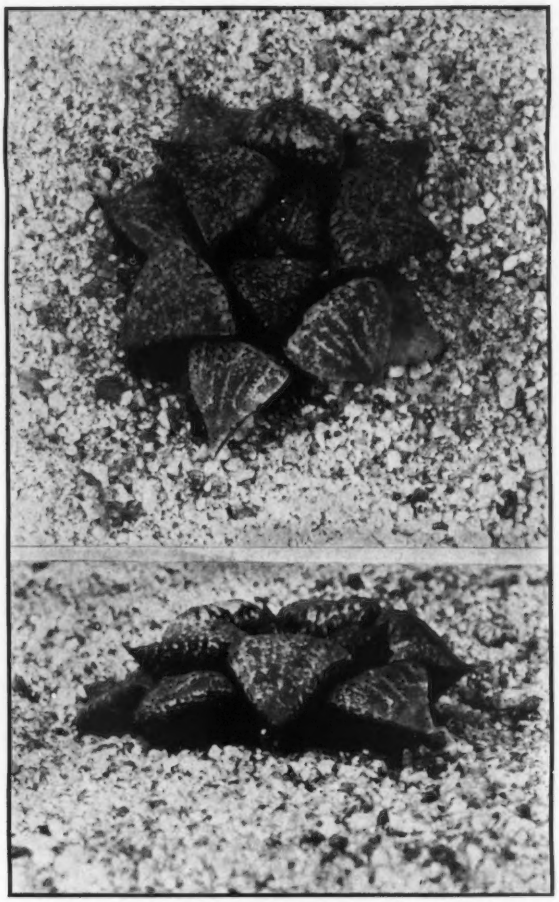
AN EXPERIMENT WITH SUCCULENTS

From Madison Cooper's GARDENING MAGAZINE

I have never had much use for hard and fast rules about anything. I know, of course, that certain broad principles are sound, but I have taken little stock in specific panaceas and taboos. This summer I made an experiment with some surplus plant material, all succulents and nearly all xerophytes.

I filled my pots with pure, unadulterated cow manure, two years old and well decomposed. In it I planted a variety of things, gave them plenty of water and sunlight and watched developments. A 3-inch sprout of *Euphorbia grandicornis,* potted about May 1st, is now, November 3, 31 inches high, deep-green and perfect. *Adromischus cristatus* has done well and bloomed, the first time in my experience. A rootless and topless stem of *Euphorbia grandicornis* has rooted and put out 12 branches averaging 6 inches in length. *Echinocactus horizonthalonius* stood still and made no growth. A 3-inch cutting of *Euphorbia splendens* is 14 inches high and covered with side shoots and leaves, and has bloomed. A 2-inch high, by 2-inch wide, cutting of *Cereus formosus monstrosus* has multiplied itself by five. Top cuttings of *Coryphantha erecta, Echinocereus Baileyi, Echinocereus cinerascens, Echinocereus Reichenbachii, Echinocereus papillosus* and *Ancistrocactus Scheeri* have rooted and doubled in size. A 6-inch cutting of *Selenicereus Macdonaldiae* is now 7 feet long with 3 branches. *Aloes variegata, grandidentata* and *ausana,* have tripled in size and put out suckers. *Haworthia fasciata* has doubled in size and put out 17 suckers and some of these have done likewise except as to the number of suckers. *Wilcoxia senilis,* 2 plants, has tripled as a graft, and quadrupled on its own roots. *Wilcoxia Poselgeri,* a very weak piece, has doubled on its own roots and quadrupled as a graft on *Nyctocereus serpentinus. Opuntia glomerata* didn't do well; rotted or sulked. *Trichocereus Schickendantzii* (4 inch cutting) rooted, doubled, and put out 3 offsets. *Cereus peruvianus* increased in size from a basal bud about 3x4 inches to a stem 3 feet high and 8 inches through at the thickest part. Several other things, including Stapelias, Lenophyllum, Sedum, Kitchingia and *Haworthia tesselata* flourished. Three seeds of an undetermined Erythrina, planted in early August, are 6 inches high and 8 or 10 broad.

I believe this experiment proves that most things do better with plenty of food and water than they do without it. W. A. BRIDWELL, (Ark.)



Haworthia picta Poelln. nat. size.

Notes on Haworthias

By J. R. BROWN

Haworthia picta, Poelln. in Desert Plt. Life X (1938) 126. photo.

Plant stemless, with few leaves and about 6 cm. in diam. Leaves ovate-oblong, acuminate, green, 3.5-4.5 cm. long, the upper part rectangularly recurved, the triangular face almost flat, 2-2.5 cm. long and 1.5-2 cm. wide at the base, pellucid, with numerous, only slightly raised, shiny tubercles, and numerous, very minute whitish flecks, and with 5-8 inconspicuous, whitish lengthwise lines, back of leaves very rounded, obliquely keeled, in the upper part towards the margins with numerous rounded small whitish spots which occasionally assume the form of tubercles, the margins of the faces crenulately roughened, the lower margins and the keel near the tip with minute teeth, the tip ending in a 3 mm. long, pellucid bristle.

Locality: Moeras River, near Little Brak River.

Flowering in So. California during Nov. and Dec. in the greenhouse.

This is a very remarkable Haworthia and is probably the most distinctly marked of the many spp. which belong to the sect. *Retusae,* Haw.

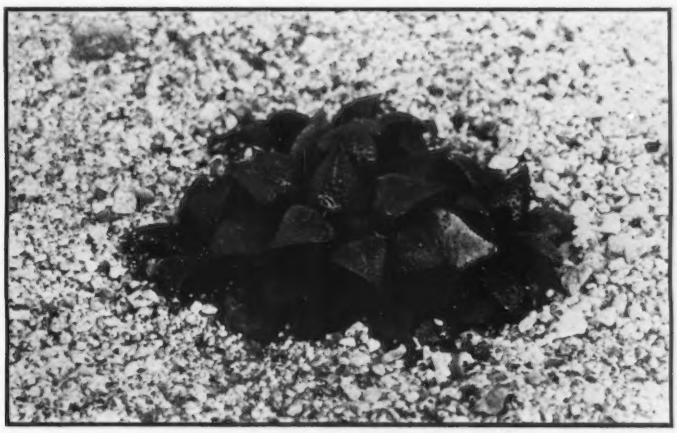
In its natural state it does not show particularly marked characters, being a plant which grows almost level with the soil and with little distinctive coloration.

The plant shown in the illustration of *Haw. picta* is from the type locality at Moeras River and a year after this photo. was taken the plant has shown great change in its appearance. It is now 8 cm. in diam. and has 17 leaves, more than twice the number it carries under natural conditions, the leaf faces are now ovate-deltoid, 2 cm. long and 2 cm. wide at the base and abruptly acuminate, the tips somewhat erect.

While plants in the natural state only show a terminal bristle on the younger leaves, this is undoubtedly due to weathering, as in cultivation this bristle remains on the oldest leaves. The minute teeth are also present on the margins of the leaf faces as well as on the lower portion of the leaf.

It is in the coloring, however, where the greatest change occurs, the color of the plants changes from a rather drab green to a rich deep green, most of the tubercles become whitish and more irregular in outline and often uniting, the lines on the faces become whiter and often streaked with vivid green, the spots on the back of leaves become whiter and extend much lower, the part of leaf below the triangular faces becomes longer and it is on this part where the most striking color occurs, the white, slightly raised markings become much larger, contrasting with the deep green of the leaf, somewhat resembling the coloring as seen in *Gasteria picta.*

Mr. W. E. Armstrong in his notes to me about this plant, says, "found growing at Moeras River, about 20 miles from Oudtshoorn, at an elevation of about 835 feet above sea level, on the flats, in clayey soil, under the protection of bushes, where they grow singly, sometimes in groups, but never in clusters, they are not easily detected as they grow level with the surface and in the dry season are often below the level of the surface."



Haworthia Maraisii Poelln. nat. size.

Haworthia Maraisii, Poelln. in Repert. Sp. Nov. XXXVIII (1935) 194.

Plant stemless, 3.5-4.5 cm. in diam., with 6-9 closely crowded leaves. Leaves 2.5-3 cm. long, brownish-green, almost rectangularly recurved in the upper part and with a triangular, pellucid face 12-15 mm. long and about 15 mm. wide at the base, often somewhat grooved in the middle, with numerous obtuse tubercles and with 3, usually very short, inconspicuous lengthwise lines, back of leaves rounded, keeled from the middle upwards, with numerous obtuse tubercles towards the tip, the margins and keel with very minute, pellucid ciliate teeth, the tip ending in a minute pellucid bristle.

Locality: In crevices of weathered shale in mountains near Swellendam.

Named in honor of W. R. B. Marais, who discovered it.

This Haworthia also changes its appearance considerably in cultivation. The plant has many more leaves, the color becomes greener, the pellucid faces are 10-12 mm. long and the same in width at the base, they become slightly rounded and recurving, the middle line often becomes much longer and seldom is the face channelled in the middle. The greatest change, however, is in the shape of the tubercles on the faces, these

become acutely pointed, as these minute pellucid tips of the tubercles are easily rubbed off, it is easy to understand how they can be readily weathered off in nature, as the leaf faces are level with the soil surface.

The numerous pointed tubercles give the plant a somewhat prickly appearance.

On the upper surface of the leaf, the faces as well as immediately below the faces, the tubercles are pellucid, on the back of the leaves the tubercles are green, the same color as the leaf.

The plant shown in the photo. illustrating *Haworthia Maraisii* was sent to me by Mr. W. E. Armstrong and regarding it he says, "found growing at Stormsvlei, at an elevation of about 581 ft. above sea level, in a sandy loam, on the northern slopes of the hill, in the open among stones, where they grow singly, sometimes close together and very hard to detect." The oldest leaves of this plant formed in its natural surroundings are now close to the soil and only one, the lighter colored leaf to the right, is readily seen in the photo., this lighter color is due to the South African dust still adhering to it, the somewhat larger size, flatter and smoother face can be observed.

This plant is also quite proliferous, however, many Haworthias which apparently remain simple in their natural state are more or less proliferous in a cultivated state.

Belonging to the sect. *Retusae* Haw. this Haworthia flowers in So. California during Sept., Oct., Nov., under glass.

The cactus GODS have been very kind to me this last spring. On two plants 6 feet tall (*Epiphyllum oxypetalum*) I had more than 200 blooms. Another Epiphyllum, name unknown, red, had 52 blooms. It was a beauty to look at. Another 3-year-old plant which I recognized from your book as *Epiphyllum crenatum*, had seven very large blooms, and pipelike, that were fully twelve inches in diameter, but my biggest surprise was in *Cereus undatus*, 8-year-old plant. It was almost 15 feet tall. Last spring I had to take off about 3 feet and I did not water or feed the plant to check the rapid growth (only what water it got from rain, which was very little) and to my surprise in early September I noticed eight buds on the stems; then being ashamed of myself, I began to feed it, and it developed in enormously large blooms. A whole neighborhood came to look at them and the blooms lasted almost five days. I moved the plant in the house just before blossoms opened, but they set no fruit, all growing in the outdoors during summer.

I saw on August 12 my Epiphyllum was going to open; I brought it in the house and put it on the dining table and more than a dozen of our friends watched it bloom from nine in the evening until about twelve midnight, when it was fully open; then we all filed by and smelled it and admired it.

MRS. CHAS. PABST, Brooklyn, N. Y.

GRAFTING COLUMN

A department conducted by Frank R. Mark, 825 Elyria Drive, Los Angeles. Mail him your problems.

To cristate collectors who live far enough south to leave their plants out in the weather the year round, the use of cellophane bags is recommended to protect your choice specimens from rain water which so often causes rot in the grafted joints.

They are particularly desirable during the winter months, as each bag makes a miniature hothouse and promotes very satisfactory growth on some crests even during cool weather. Colored or painted bottles, with bottoms removed, may be used, but their use of course is limited to plants of corresponding height.

The bags are equally satisfactory on woolly cacti such as Cephalocereus, as they keep off the soot and dirt, and the plants remain beautiful specimens.

Care should be taken to secure bags amply large and long enough to remain on without tying at the bottom; for, if tied, a damp sweating condition will develop, thereby promoting rot.

Cellophane bread wrappers are fairly satisfactory for small plants, but larger bags may be purchased from me *at actual cost*, plus postage, as an added service from the Society to our members. This is a special, heavy grade of cellophane, known as No. 300 M.S.A.T., for outdoor use. It is economical in cost, lasts several months, but will be found more enduring if removed except during rainy weather.

No doubt the entire grafting and cristate fraternity will share my appreciation of the interest of Dr. R. W. Poindexter in the grafting column and also in our troubles, as evidenced in the following letter:

Dear Mr. Mark:

I enjoyed your grafting column in the last issue of the JOURNAL. This is one of the live features of the JOURNAL. In regard to the compatibility of various stocks, I have found that Serpentinus is particularly compatible to all the Echinocereus which I have tried. There seems to be a close affinity and a well-made graft unites so well that later the line of joining is scarcely visible. And furthermore, the grafts appear much more permanent than all others. You may have observed the same. R. W. POINDEXTER.

I agree with Dr. Poindexter and might add that I find Serpentinus is usually compatible with *nearly all* species of cacti and that its use is only limited to its rather small size. The many complaints as to its short life as a stock are usually due to the fact that the scion gets too large. In other words, the root system is called upon to support more top than it is capable of.

The well-known "barnyard" type of spineless Opuntia is also good for most Echinocereus, especially crests. It promotes a very rapid growth and the scions can then be transferred to more attractive and permanent stock.

MR. MARION P. BERG'S OFFER

To the non-professional member who has contributed the most during the past year to the benefit of the Society and especially to the amateur collector, I will contribute a "Toumeya papyracantha" as a prize.

By non-professional I mean a member who is not a dealer and who holds no Doctor's degree.

Members of the Society may send their vote to Mr. Marion P. Berg, 720 N. Solano Ave., Albuquerque, N. Mexico.

NEW WHOLESALE LIST

R. W. Poindexter Nursery, 1000 North Temple St., Compton, Calif., has issued a November wholesale list of cacti and succulents. This list is free to retailers.

The following 8 pages are the 7th Installment of the Monograph "Colorado Cacti" by Dr. C. H. Boissevain and Miss Carol Davidson.

The Aboriginal Therapeutic Uses of Lophophora Williamsii

By RICHARD EVANS SCHULTES

Lophophora Williamsii (Lemaire) Coulter in Contrib. U. S. Nat. Herb., *3* (1894) 131.
Peyotl zacatensis Hernandez De Historia Plantarum Novae Hispaniae, *3* (1790) 70.
Echinocactus Williamsii Lemaire ex Salm-Dyck in Allg. Gartenz., *13* (1845) 385.
Ariocarpus Williamsii (Lemaire) Voss in Vilmorin's Illustr. Blumengärtn., (1872) 368.
Anhalonium Williamsii (Lemaire) Lemaire in Förster Handbuch der Kakteenkunde, ed. 2, (1885) 233.
Anhalonium Lewinii Hennings in Gartenfl., *37* (1888) 410.
Mammillaria Williamsii (Lemaire) Coulter in Contrib. U. S. Nat. Herb., *2* (1891) 129.
Anhalonium Rungei Hildmann in Monatschr. f. Kakteenk., *3* (1893) 68; nomen nudum.
Anhalonium subnodusum Hildmann in Monatschr. f. Kakteenk., *3* (1893) 68; nomen nudum.
Lophophora Williamsii (Lemaire) Coulter var. *Lewinii* (Hennings) Coulter in Contrib. U. S. Nat. Herb., *3* (1894) 131.
Anhalonium Jourdanianum Rebut Catalogue de Cactées et Plantes Grasses Diverses, undated. Lewin in Ber. Deutsch. Bot. Gesel., *12* (1894) 289; nomen nudum.
Echinocactus Lewinii (Hennings) K. Schumann in Engl. & Prantl. Natürl. Pflanzenfam., *3*, 6a, (1894) 173.
Mammillaria Lewinii (Hennings) Karsten Deutsch. Fl., ed. 2, *2* (1895) 457.
Echinocactus Lewinii (Hennings) K. Schumann var. *Jourdanianus* Michaelis Beitrage zur Vergleichenden Anatomie de Gattungen *Echinocactus, Mammillaria,* und *Anhalonium,* (1896).
Anhalonium Visnagra K. Schumann in Monatschr. f. Kakteenk., *6* (1896) 174; in synon.
(1) *Contribution from the Laboratories of Economic Botany, Botanical Museum, Harvard Univ.*
Lophophora Lewinii (Hennings) Rusby in Bull. Pharm., *8* (1894) 306. Thompson in Rept. Mo. Bot. Gard., *9* (1898) 133.
Echinocactus Jourdanianus (Rebut) Rebut ex Maass in Monatschr. f. Kakteenk., *15* (1905) 122; nomen nudum.
Echinocactus Williamsii (Lemaire) *pseudo-Lewinii hortulorum* Rouhier in Trav. Lab. Mat. Med. Pharm. Gal., *17,* for 1926 (1927) 61.
Echinocactus pseudo-Lewinii Thompsonii Rouhier in Trav. Lab. Mat. Med. Pharm. Gal., *17,* for 1926 (1927) 62.
Echinocactus Williamsii (Lemaire) var. *lutea* Rouhier in Trav. Lab. Mat. Med. Pharm. Gal. *17,* for 1926 (1927) 65.
Echinocactus Williamsii pseudo-Lewinii Thompsonii Rouhier in Trav. Lab. Mat. Med. Pharm. Gal., *17,* for 1926 (1927) fig. 33; nomen nudum.
Lophophora Williamsii (Lemaire) Coulter *cristata* A. D. Houghton in Journ. Cact. & Succ. Soc. Am., *2* (1931) 490.

Much has been written about the use of the narcotic peyote (*Lophophora Williamsii*) (Lemaire) Coulter as a religious sacrament among Mexican and American Indians. Recently, several papers have made this voluminous literature available in concise form (4, 15, 16, 17, 18, 19). The extensive use of peyote as a medicine, however, has not been sufficiently emphasized.

Up to nine alkaloids are known to occur in varying amounts and proportions in peyote; anhaline, anhalamine, anhalonidine, anhalonine, anhalinine, anhalidine, lophophorine, mescaline, and pellotine. Because of the physiological activity of these constituents of the cactus, peyote is capable of inducing an intoxication which is characterized by a feeling of ease and well-being, by control of the limbs and senses, by absence of violence, and occasionally by visual and auditory hallucinations and abnormal synaesthesiae. There are seldom uncomfortable after-effects among users. As a result of this remarkable type of intoxication, peyote has come to be regarded by many Indians as the vegetal incarnation of a deity.

Since 1885 (17), the ancient peyote-worshipping cult has spread, in a modified form, to more than thirty-two American Indian tribes. In 1922, the membership of the peyote-cult in the United States was conservatively placed at 13,300 (15); the constituency is probably much greater to-day.

Figure I. *Lophophora Williamsii.* Photo courtesy Botanical Museum, Harvard University

As a result of the physiological activity of its alkaloids, peyote possesses many properties which the natives regard as valuable in the treatment of disease, both spiritual and physical. Indeed, the primary use of *Lophophora Williamsii* in the religious cult seems to have been based upon the appeal of its supposed curative and stimulating properties. The narcotic effects of the cactus, especially the extraordinary colour-visions induced, were of secondary importance in the establishment and perpetuation of the cult (18). Peyote is, without any doubt, the most important medicine used among North American Indians at the present time and seems to be replacing other older, but less spectacular, plant remedies (18,20). It is used commonly in daily life as a remedial agent, and the peyote-ceremonies of almost all tribes of Mexican and American Indians include a definite curing ritual in which the narcotic is administered in large doses to the ill.

The sustaining and stimulating properties of *Lophophora Williamsii* which enable the user to do an excessive amount of work without feeling fatigue are hardly separable from those properties which may be called curative. The stimulating and curative properties of peyote were known to the ancient Mexicans, and this knowledge persists undiminished to the present time. It is significant that tribes which never

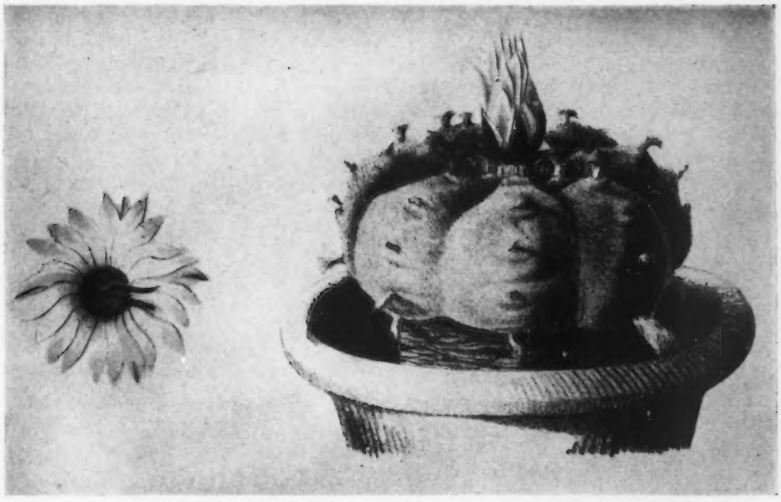


Figure II. Earliest illustration of Lemaire's *Echinocactus Williamsii*. From Pfeiffer and Otto—*Abbildung und Beschreibung blühende Kakteen*, Vol. 2 (1846) 35.

praticed the religious rites of the peyote-cult esteem the plant as a panacea.

The examples of the medicinal use of *Lophophora Williamsii* among natives are very numerous. A few, however, will illustrate the extent of the faith which is placed in the curative powers of the plant[2]. In Mexico, the Spaniards found a number of tribes using peyote, or *peiotl*, as a medicine. Writing very shortly after the conquest, Hernandez (3) reported that the Aztecs used *Peyotl zacatensis* (the peyote of Zacatecas) in treating rheumatism. The Tarahumare and Huichol Indians were found by the explorer Lumholtz (6) to be utilizing the narcotic plant as a remedial agent in cases of snake and scorpion bites, bruises, cuts, rheumatism, and many other ills. The Opata tribe used dried and powdered peyote to apply to deep arrow-wounds as a cleaning and healing medicine (4). The Acaxee and the Lagunero Indians ate peyote as a stimulant during games and races (10). The Sonoran Indians, like the Opatas, packed powdered peyote into wounds until they were healed (1). The Lipans used peyote similarly (4). During battles with the Spaniards at the time of the conquest, the natives of the Sierra de Alica ate the cactus steadily as a tonic and stimulant (14). The Tamaulipas take peyote as a stimulant during long dances (12). The Caxcanes are said to employ a decoction of *Lophophora Williamsii* for cramps, swoonings, and spasms (14).

Among the peyote-worshipping Indians of the United States, the appeal of the plant as an all-powerful medicine is equally as strong as it is in Mexico. Almost every tribe which uses the narcotic as a religious sacrament uses it also as a panacea. The Taos Pueblo Indians have extreme faith in the efficacy of peyote as a snake-bite remedy (9). Cases of blindness have been reported by Indians to have been "cured" with peyote among the Wichita and Winnebago tribes (4,13). During ethnobotanical studies among several Oklahoma tribes, I found that peyote was used as a panacea: among the Kiowa, Kickapoo, and Shawnee Indians, *Lophophora Williamsii* is prescribed for tuberculosis, hemorrhages, pneumonia, influenza, colds, grippe, intestinal ills, scarlet fever, diabetes, rheumatism, and venereal diseases (15,18); to this list, LaBarre (4) adds hiccoughs, childbirth, skin diseases, breast pains, and pulmonary troubles in general. A Shawnee told me that a decoction of peyote was good as an antiseptic and healing wash for wounds and bruises and was soothing if rubbed warm on aching limbs (15). The Shawnee are also said to value it as a remedy for sores and snake-bites (4). Partly chewed mescal buttons (the dried tops of the plant) are packed around an aching tooth to bring relief (15). Peyote is often eaten in daily life among the Plains Indians as a tonic or as "aspirin" (15, 18). This is exactly parallel to its use among rural Mexicans as a stimulating tonic and analgesic; the verb *empeyotizarse* has become accepted in Spanish as spoken in Mexico and signifies self-medication with peyote, aspirit, or

any other medicine to relieve indisposition following alcoholic intoxication (18).

Among the Plains Indians of the United States, the most important therapeutic use to which *Lophophora Williamsii* is put is in the treatment of tuberculosis. Extreme faith is placed in its efficacy in alleviating or curing this disease. Mooney (8), for example, reported a "cure" of consumption with peyote, adding that "the returned students from the east, who invariably acquire consumption in the damp eastern climate, are usually among the staunchest defenders of the ceremony, having found by experience that the plant brings them relief."

The fact that the curing rituals (18) are often an incorporate part of the peyote-ceremonies of worship and that ceremonies are held more frequently in times of sickness is evidence that the appeal of peyote as a physical as well as spiritual panacea is of fundamental import.

Yet the cures which *Lophophora Williamsii* are supposed to effect go far beyond the realm of the physical being. According to Indian belief, the plant is "inhabited" with forces which are allies not only in combating physical ills but also in ridding the mind of spells and supernaturally created dangers. For example, the Tarahumare and Huichol Indians of Mexico attribute health and longevity to the constant use of peyote; peyote is eaten at death-feasts to fortify the living against death; when rubbed on the knees it is thought to give strength in walking (2, 6). The Tarahumare regard peyote as a

FIGURE III. Entire plant of peyote (*Lophophora Williamsii* (Lem.) Coult.) showing details of the chlorophyll-bearing crown of the plant. Variation in the number and appearance of the ribs has given rise to much confusing taxonomic controversy, but this thirteen-ribbed form is typical of older plants. It is this crown which, when cut from the root and dried, is known as the *mescal button*, two of which are illustrated in figure IV. Natural size.

FIGURE IV. Mescal buttons, the dried crowns of *Lophophora Williamsii*. These are "type" specimens collected in Mexico in 1897 by the explorer, Carl Lumholtz, and sent to the Gray Herbarium. The Mexican Indians who collect peyote string the newly cut crowns on rope and hang them on the backs of mules to dry on the journey home from the peyote fields, hence the central perforation in the lower button. *Above:* View of the top of the dried crown showing the tufts of matted hair still persisting on the areolae. *Below:* View of the base of the crown where it was cut from the root. Natural size. Fruit Room Collection (unnumbered), Gray Herbarium, Harvard University; on loan in Botanical Museum, Harvard University. (Photos courtesy Botanical Museum, Harvard Univ.)

safeguard against witchcraft (6). From a Comanche Indian, LaBarre learned (4) that the belief exists that peyote enables a user to "hear" the approach of an enemy.

The wide variety of uses to which peyote is put by Indians is evidence that the plant is of exceptional value in Indian life and economy. It is at once clear, however, that one plant can hardly be efficacious in all of these therapeutic applications. Even with its extremely complex alkaloidal make-up, *Lophophora Williamsii* is not a panacea. The fact remains, nevertheless, that it *is* used as such by thousands of Indians and that its users have absolute faith in its powers as a sacred medicine.

A review of the very interesting work which pharmacologists and physiologists have conducted to ascertain how useful the peyote-alkaloids might be in curative medicine is beyond the scope of this brief article. It should be pointed out, however, that the results of pharmacological studies indicate that *Lophophora Williamsii* and some of its alkaloids are actually efficacious in alleviating some of the ills which the Indians "cure" with the plant.

Peyote and some of its alkaloids have been utilized as respiratory stimulants in the treatment of angina pectoris and asthma (5, 14); some of the alkaloids have been suggested as antispasmodics for asthmatic complaints, convulvions, abdominal pains, and colic, as analgesics for nervous headaches, as substitutes for opium in delirium, as sedatives in cases of melancholy, hypochondria, and neurasthenia (11,14). Rouhier (14) suggests the use of peyote-extracts or alkaloids as analgesics in treating rheumatism, as febrifugal agents, and as aids in the cure of opium and alcohol habits.

While the peyote-alkaloids have never been major medicinals, several have found minor uses in pharmaceutical practice (21). Anhalonine and anhalonidine have been sold as cardiac and respiratory stimulants (7), and pellotine is employed as a calmative (21). As further studies are made, it is possible that the peyote-alkaloids may assume places of greater importance in medicine.

During the last fifteen years, methods of synthesizing these alkaloids have been discovered. This will increase the availability of these substances and may prove to be an incentive to further investigation. Although a number of scientific writers seem to have exaggerated the therapeutic potentialities of *Lophophora Williamsii,* it is entirely possible that more complete and systematic pharmacological studies may result in the discovery of new applications for these exartordinary alkaloids in therapeutical practice. Certainly the ancient and persistent faith of the natives of Mexico and the United States in the therapeutic powers of *Lophophora Williamsii* justifies more concentrated pharmacological work than has hitherto been carried out.

(The literature concerning peyote is very extensive, over 400 references being known to the writer. This brief list includes only a few which may be used for an extension of the concentrated information contained in the foregoing article.)

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Mammillaria Lindsayi sp. nov.

By Dr. R. T. Craig

Photo by Author

Corpus simplex et caespitosum; mamillae conoideae, quadrilaterae, non angulares, sucus lacteus, axillae lana densa alba; spinae centrales 3-4, 4-12 mm., rectae, flavae ad rufae; spinae radiales 12-14, 2-8 mm., albae ad aureae; flores tubulati; sepala virido-flava, ovata, obtusa, tenuiter cilata; petala virido-flava, obtusa, stigmata 4-5, virido-flava; fructus coccineus, clavaeformis; semina subfusca.

Body simple and cespitose in clumps up to 1 meter in diameter, heads globular, apex flat and sunken, branching from base, to 300 mm. in height, to 150 mm. wide.

Tubercles firm in texture, dull gray green, conical quadrangular, not angled, keeled ventrally, milky sap, length 6-10 mm., width at base 5-7 mm., arranged in 13 and 21 spirals.

Areoles oval, 1.5-2. mm. wide, scant brownish felt only in youth, soon naked.

Axils very dense white wool so as to cover the tubercles in circle in flowering and fruiting area, up to 8 tortuous white bristles, longer than tubercles and persisting.

Central spines 2-4, mostly 4, 4-12 mm. long, upper 2-3 shortest, lower one longest; acicular, lower heavier, straight, smooth, stiff, bulbous base; light golden brown to somewhat reddish becoming gray horn in age; spreading, lower nearly porrect, others dorsally.

Radial spines 10-14, 2-8 mm., upper 3-4 shortest and very slender acicular, lower heavier; smooth, straight; upper white, lower tan to golden yellow; horizontal.

Flowers form ring in top but not in new growth, almost tubular, February to May, open during sunny hours for several days, length 15-20 mm., width 10 mm.

Ovary 3 mm. long and wide, tipped with wool at lower end.

Outer perianth segments (ap. 24) light greenish yellow with orange yellow mid stripe; elliptical, tip obtuse, margins fine ciliate, 15x2 mm.

Inner perianth segments (ap. 20) light greenish yellow; elliptical, tip obtuse and emarginate, margins fine ciliate to entire, 15x2.5 mm.

Anthers lemon yellow, small, flattened.

Filaments very pale yellow to white.

Style light yellow, 10-12 mm.

Stigma lobes 4-5, tannish greenish yellow, 2 mm. long, 1 mm. above anthers.

Fruit appear in July to August of same year as flowering, dried perianth persists, scarlet, 20x5 mm., cylindric clavate.

Seeds light brown, 1x0.4 mm., elongate curved pyriform, lateral hilum, reticulate, not pitted.

Distribution: S. W. Chihuahua.

Type locality: Molinas to Sierra Colorado (10-15 miles northeast of junction of Rio Chinapas and Rio Fuerte; Lat. 27° 10', Long. 108° 15').

Habitat: in partial shade on canyon walls or slopes, in leaf mold in cracks in rocks. Mountainous ap. 4,000 feet.

Var. robustior: Tubercles larger to 13 mm. wide at base. Central spines heavier to strong subulate, to 20 mm. long. Radial spines heavier to strong acicular to 13 mm.

Mammillaria Lindsayi sp. nov. Several variations of the type material were collected by George Lindsay and Dr. R. T. Craig in April, 1939, in the immediate vicinity of the type locality and also along the Rio Watchera, but the salient characteristics of all of them are so nearly identical that all have been included in the one species.

The type specimen has been deposited in the U. S. National Museum Herbarium as *Mammillaria Lindsayi*, No. 1791489.

FROM NEW ZEALAND

Dear Mr. Marshall:

"It seems almost impossible to obtain any of the rarer cacti now without the incubus of grafting entering into the matter. Personally I find that my plants do best on their own roots, for although the growth may not be as fast in some cases the plants flower as well and are seldom lost through the many troubles associated with grafted specimens. It is surely time that someone took up this matter with the JOURNAL and pointed out that actually grafting, for the main point, is a fad and a means of working off what are often unsaleable stocks and adding their cost to that of the scion. While I admit that rare plants suffering from disease may be saved in this manner and crests are particularly suited to the treatment, I have yet to be convinced that there is any method in the heterogenous scion—stock complex that it has been my misfortune to encounter. If the procedure had a valid basis for survival, excluding those factors mentioned, why is there no treatise in existence to lend guidance on the subject. With many other horticultural groups, and I refer mainly to fruit trees, etc., the subject has received the attention it merits and is productive of only the best results.

"At the present time I have a Lobivia grafted on a Cereus stock and the result is ludicrous, for the Lobivia is now over half a pound in weight, does not flower well and is supported by four inches of one-half inch diameter stock, which in turn has suitable scaffolding erected to prevent imminent collapse. The whole effect is anything but aesthetic. Another case is a plant of *Echinocereus pensilis* on *Nyctocereus serpentinus* stock. I have had this wretched specimen for four years and it *will not grow* and that statement is nearly as true for the stock also, as the latter produced three offsets which were promptly removed. All my other Echinocereus on their own roots all around it have virtually reached maturity in this time, so this year, in desperation, I intend removing it from the stock just to see what will happen.

"I trust you will bear with my diatribe on some of my cactus troubles, but I know you are keenly interested in the group from the many items appearing in the JOURNAL under your name and it seems to me that you might welcome a new aspect on the question of cacti from overseas. This year I have had 32 flowers on a beautiful ten-headed, two-foot plant of *Oreocereus trollii* and am about to see the flowers of *Binghamia humboldtii* for the first time. I have two large plants of *Opuntia pachypus* and am keenly awaiting their turn to flower as I have not heard of anyone having seen this in flower yet and thought I might send a note to the JOURNAL when this eventuates."

E. S. GOURLAY.

Your comment on grafted plants in your recent letter is so completely in accord with my views on the subject that I am taking the liberty of quoting them in an early issue of the JOURNAL with this reply appended.

Grafting as an aid in the propagation of rare species grown from seed has a certain commercial value, but is so new that no authoritative treatise has as yet appeared on it. I hope that if, and when, such a treatise is written it will include the explanation that such grafting should be considered purely as an aid to fast propagation and that grafts so made have no more place in a collection of well-grown plants than would a two-headed calf in a herd of thoroughbred cattle.

Dealers here have found that a year-old seedling can be grafted on suitable stock and several years' growth forced into one year. The practice is then to re-graft on huskier stock the second year or sooner, thus forcing the plant to maturity or to considerable size in the third year.

The better dealers then remove the scion from the stock and in due course root it. The resultant plant is usually exaggerated but after rooting frequently assumes normal proportions. This process is, to my mind, justified by the results.

Continuance of a mature or fairly large scion on a stock in the collections (excepting cristate forms) has no possible justification and I hope that the practice of offering such unnatural monstrosities will be discontinued in the near future by all dealers.

In most instances the scion soon exhausts the stock anyway, and constant re-grafting is necessary unless the owner rooted the scion, a process for which most collectors are not equipped. W. T. M.

We do not attempt to edit the names of plants appearing in the advertisements.

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